

## In the Claims

The following is a complete listing of the claims and replace all prior claims in the application:

1           1. (Withdrawn) A method for forming self-pinned abutted junction heads,  
2           comprising:

3           forming a free layer having a first end and a second end defining a width selected  
4           to form a desired trackwidth; and

5           forming an extended self-pinned bias layer extending beyond the ends of the free  
6           layer, the self-pinned bias layer extending beyond the free layer increasing the volume of  
7           the extended self-pinned bias layer to provide greater thermal stability and stronger  
8           pinning of the free layer.

1           2. (Withdrawn) The method of claim 1 further comprising forming a self-  
2           pinned layer on a side of the free layer opposite the self-pinned bias layer, the self-pinned  
3           layer extending beyond the ends of the free layer wherein the free layer is disposed at a  
4           central region of the self-pinned layer.

1           3. (Withdrawn) The method of claim 2, wherein the forming the self-pinned  
2           bias layer and the self-pinned layer further comprises forming a self-pinned bias layer  
3           and a self-pinned layer having increased stress anisotropy.

1           4. (Withdrawn) The method of claim 1 further comprising forming a spacer  
2           layer between the free layer and the self-pinned bias layer.

1           5. (Withdrawn) The method of claim 1 further comprising forming a first  
2    shield layer interleaving the self-pinned layer between the first shield layer and the free  
3    layer and forming a second shield layer interleaving the self-pinned bias layer between  
4    the second shield layer and the free layer.

1           6. (Withdrawn) The method of claim 5 further comprising forming a first  
2    seed layer between the first shield layer and the self-pinned layer and forming a second  
3    seed layer between the self-pinned bias layer and the second shield layer.

1           7. (Withdrawn) The method of claim 1, wherein the forming the extended  
2    self-pinned bias layer further comprises forming the extended self-pinned bias layer with  
3    a large negative magnetostriction.

1           8. (Withdrawn) The method of claim 7 further comprising forming a self-  
2    pinned layer on a side of the free layer opposite the self-pinned bias layer, the self-pinned  
3    layer having a large positive magnetostriction.

1           9. (Currently Amended) A self-pinned abutted junction magnetic read  
2    sensor, comprising:

3           a free layer having a first end and a second end defining a width selected to form  
4    a desired trackwidth; and

5           a self-pinned ferromagnetic bias layer extending beyond the ends of the free layer;  
6    ~~the self-pinned ferromagnetic bias layer extending beyond the free layer to increase the~~  
7    ~~volume of the extended self pinned bias layer thereby improving thermal stability and~~  
8    ~~pinning of the free layer.~~

1           10. (Currently Amended) The sensor of claim 9 further comprising a self-  
2    pinned layer formed on a side of the free layer opposite from the self-pinned bias layer,  
3    the self-pinned layer extending beyond the ends of the free layer wherein the free layer is  
4    disposed at a central region of the self-pinned layer ~~and wherein the self pinned bias layer~~  
5    ~~and the self pinned layer have increased stress anisotropy.~~

1           11. (Previously Presented)       The sensor of claim 9 further comprising a  
2    first and second hard bias layer abutting at least a portion of the first and second ends of  
3    the free layer in a longitudinal direction.

1           12. (Previously Presented)       The sensor of claim 9 further comprising a  
2    spacer layer formed between the free layer and the self-pinned ferromagnetic bias layer.

1           13. (Previously Presented)       The sensor of claim 9 further comprising a  
2       first shield layer interleaving the self-pinned layer between the first shield layer and the  
3       free layer and a second shield layer interleaving the self-pinned ferromagnetic bias layer  
4       between the second shield layer and the free layer.

1           14. (Previously Presented)       The sensor of claim 13 further comprising a  
2       first seed layer formed between the first shield layer and the self-pinned layer and a  
3       second seed layer formed between the self-pinned ferromagnetic bias layer and the  
4       second shield layer.

1           15-16. (Canceled)

1           17. (Currently Amended) A magnetic storage system, comprising:  
2           a moveable magnetic storage medium for storing data thereon;  
3           an actuator positionable relative to the moveable magnetic storage medium; and  
4           a magnetoresistive sensor, coupled to the actuator, for reading data from the  
5           magnetic recording medium when position to a desired location by the actuator, wherein  
6           the magnetoresistive sensor further comprises:  
7            a free layer having a first end and a second end defining a width selected  
8            to form a desired trackwidth; and  
9            a self-pinned ferromagnetic bias layer extending beyond the ends of the  
10          free layer, ~~the self pinned ferromagnetic bias layer extending beyond the free layer to~~  
11          ~~increase the volume of the extended self pinned bias layer thereby improving thermal~~  
12          ~~stability and pinning of the free layer.~~

1           18. (Currently Amended) The magnetic storage system of claim 17 further  
2           comprising a self-pinned layer formed on a side of the free layer opposite from the self-  
3           pinned bias layer, the self-pinned layer extending beyond the ends of the free layer  
4           wherein the free layer is disposed at a central region of the self-pinned layer ~~and wherein~~  
5          ~~the self pinned bias layer and the self pinned layer have increased stress anisotropy.~~

1           19. (Previously Presented)           The magnetic storage system of claim 17  
2           further comprising a first and second hard bias layer abutting at least a portion of the first  
3           and second ends of the free layer in a longitudinal direction.

1           20. (Previously Presented)       The magnetic storage system of claim 17

2    further comprising a spacer layer formed between the free layer and the self-pinned  
3    ferromagnetic bias layer.

1           21. (Previously Presented)       The magnetic storage system of claim 17

2    further comprising a first shield layer interleaving the self-pinned layer between the first  
3    shield layer and the free layer and a second shield layer interleaving the self-pinned  
4    ferromagnetic bias layer between the second shield layer and the free layer.

1           22. (Previously Presented)       The magnetic storage system of claim 21

2    further comprising a first seed layer formed between the first shield layer and the self-  
3    pinned layer and a second seed layer formed between the self-pinned ferromagnetic bias  
4    layer and the second shield layer.

1           23-24. (Canceled)

1           25. (Currently Amended) A self-pinned abutted junction magnetic read  
2        sensor, comprising:  
3           means for sensing having a first end and a second end defining a width selected to  
4        form a desired trackwidth; and  
5           self-biased ferromagnetic means for biasing the means for sensing, the self-biased  
6        ferromagnetic means for biasing the means for sensing extending beyond the ends of the  
7        means for sensing, ~~the extension of the means for biasing the means for sensing to~~  
8        ~~increase the volume of the means for biasing to improve thermal stability and pinning of~~  
9        ~~the free layer.~~

1           26. (Currently Amended) A magnetic storage system, comprising:  
2           a moveable magnetic storage means for storing data thereon;  
3           an actuator positionable relative to the moveable magnetic storage medium; and  
4           a magnetoresistive sensor, coupled to the actuator, for reading data from the  
5           magnetic recording medium when positioned to a desired location by the actuator, wherein  
6           the magnetoresistive sensor further comprises:  
7               means for sensing having a first end and a second end defining a width  
8               selected to form a desired trackwidth; and  
9               self-biased ferromagnetic means for biasing the means for sensing, the  
10          self-biased ferromagnetic means for biasing the means for sensing extending beyond the  
11          ends of the means for sensing, ~~the extension of the means for biasing the means for~~  
12          ~~sensing increasing the volume of the means for biasing to provide greater thermal~~  
13          ~~stability and stronger pinning of the free layer.~~